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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,270	12/30/2003	Saikumar Jayaraman	884.888US1	7480

21186 7590 03/14/2007  
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
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MINNEAPOLIS, MN 55402

EXAMINER
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TSOY, ELENA

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/14/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/751,270

Applicant(s)

JAYARAMAN, SAIKUMAR

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 January 2007.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14-24 and 31-36 is/are pending in the application.  
4a) Of the above claim(s) 21-24 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-12, 14-20 and 31-36 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

Amendment filed on January 29, 2007 has been entered. Claim 13 has been cancelled. No new claims have been added. Claims 1-12, 14-24, and 31-36 are pending in the application. Claims 21-24 are withdrawn from consideration as directed to a non-elected invention.

***Claim Objections***

1. Objection to claims 14 and 34 because of the informalities has been withdrawn due to amendment.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The language of claim 9 is confusing because it is almost impossible to understand: (i) how many layers are on the upper surface of the substrate and how many layers are on the lower surface of the substrate; (ii) how to form "subsequent upper second film, and upon the lower surface" (since there is an upper first film disposed on the upon the upper surface, the subsequent upper second film should be logically formed on the upper first film); (iii) where a lower first polymer is disposed: upon the upper or lower surface?

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Rejection of claims 1, 2, 4-10, 14-17, 20, 31-32 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Carter (US 6,730,617) has been withdrawn due to amendment.

7. Rejection of claims 1, 2, 4, 5, 7, 10, 14, 15, 17 under 35 U.S.C. 102(e) as being anticipated by Jacobson et al (US 6,517,995) has been withdrawn due to amendment.

8. Rejection of claims 5, 7, 8, 15 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jacobson et al has been withdrawn due to amendment.

9. Rejection of claim 13 under 35 U.S.C. 103(a) as being unpatentable over Carter in view of Cobbley et al (US 6,545,498) has been withdrawn due to cancellation of the claim.

10. Claims 1, 2, 4, 5, 7, 10-12, 14, 15, 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al.

Jacobson et al are applied here for the same reasons as set forth in paragraphs 8 and 14 of the Office Action mailed on 7/27/2006.

As to claims 1 and 14, Jacobson et al fail to teach in situ testing the substrate while attached as part of an array of substrates. It is well known in the art that after metallization, the substrate is conventionally tested for thickness and quality of a deposited metal coating. The testing of a metallized substrate can be done either in situ or after separating it from its lay out.

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Obviously, one of ordinary skill in the art would perform in situ testing if it is possible without separating it from its lay out to speed up the testing.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed a test of coated substrate in Jacobson et al preferably in situ if possible with the expectation of providing the desired rapid testing. One of ordinary skill in the art would have reasonable expectation of success in performing in situ testing, since it is well known in the art that no bus bars are needed to impose cathodic behavior to the substrate in electroless copper plating which would make it possible to test the substrate in situ.

11. Claims 1, 2, 4-12, 14-20, and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carter.

Carter is applied here for the same reasons as set forth in paragraphs 7 and 13 of the Office Action mailed on 7/27/2006.

As to claims 1, 14, 31 and 34, Carter fails to teach in situ testing the substrate while attached as part of an array of substrates. However, in situ testing the substrate would be obvious for the same reasons as discussed above in paragraph 10.

12. Claims 1, 2, 4-12, 14-20, and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carter in view of Cobbley et al (US 6,545,498).

Carter in view of Cobbley et al are applied here for the same reasons as set forth in paragraph 15 of the Office Action mailed on 7/27/2006.

Cobbley et al teach that flip-chip semiconductor assemblies, each including integrated circuit (IC) dice and an associated substrate, are electrically tested before encapsulation using an in-line or *in-situ* test socket or probes at a die-attach station (See Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have tested a substrate of Carter in situ because Cobbley et al teach that flip-chip semiconductor assemblies, each including integrated circuit (IC) dice and an associated substrate, are electrically tested before encapsulation using an in-line or *in-situ* test socket or probes at a die-attach station. One of ordinary skill in the art would have reasonable expectation of success in performing in situ testing, since it is well known in the art that no bus bars are needed to impose cathodic behavior to the substrate in electroless copper plating which would make it possible to test the substrate in situ.

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13. Claims 14, 15, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al in view of Cobbley et al.

Jacobson et al are applied here for the same reasons as above. Jacobson et al fail to teach in situ testing the substrate while attached as part of an array of substrates.

Cobbley et al are applied here for the same reasons as above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have tested a substrate of Jacobson et al in situ because Cobbley et al teach that flip-chip semiconductor assemblies, each including integrated circuit (IC) dice and an associated substrate, are electrically tested before encapsulation using an in-line or *in-situ* test socket or probes at a die-attach station. One of ordinary skill in the art would have reasonable expectation of success in performing in situ testing, since it is well known in the art that no bus bars are needed to impose cathodic behavior to the substrate in electroless copper plating which would make it possible to test the substrate in situ.

14. Claims 3, 6, 20, 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al in view of Bulthaup et al for the reasons of record set forth in paragraph 10 of the Office Action mailed on 7/27/2006.

15. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al in view of Cobbley et al, further in view of Bulthaup et al for the reasons discussed above and as set forth in paragraph 10 of the Office Action mailed on 7/27/2006.

16. Claim 3 under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al/Carter/ in view of Walter et al (US 4,099,913) for the reasons of record set forth in paragraph 9 of the Office Action mailed on 7/27/2006.

17. Claims 6, 8, 9, 16, 20, 31, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al in view of Carter for the reasons of record set forth in paragraph 12 of the Office Action mailed on 7/27/2006.

18. Claims 31, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al in view of Cobbley et al, further in view of Carter for the reasons discussed above and as set forth in paragraph 12 of the Office Action mailed on 7/27/2006.

***Response to Arguments***

15. Applicants' arguments filed January 29, 2007 have been fully considered but they are not persuasive.

Applicants argue that no cited references teach or suggest a limitation "in situ testing the substrate while attached as part of an array of substrates".

The Examiner respectfully disagrees with this argument.

(i) As was discussed above, it is well known in the art that after metallization, the substrate is conventionally tested for thickness and quality of a deposited metal coating. The testing of a metallized substrate can be done either in situ or after separating it from its lay out. Obviously, one of ordinary skill in the art would perform in situ testing if it is possible without separating it from its lay out to speed up the testing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed a test of coated substrate in the cited prior art preferably in situ if possible with the expectation of providing the desired rapid testing. One of ordinary skill in the art would have reasonable expectation of success in performing in situ testing, since it is well known in the art that no bus bars are needed to impose cathodic behavior to the substrate in electroless copper plating which would make it possible to test the substrate in situ.

(ii) In contrast to Applicants argument, Cobbley et al do teach that flip-chip semiconductor assemblies, each including integrated circuit (IC) dice and an associated substrate, are electrically tested before encapsulation using an in-line or *in-situ* test socket or probes at a die-attach station (See Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have tested a substrate of the cited prior art in situ because Cobbley et al teach that flip-chip semiconductor assemblies, each including integrated circuit (IC) dice and an associated substrate, are electrically tested before encapsulation using an in-line or *in-situ* test socket or probes at a die-attach station. One of ordinary skill in the art would have reasonable expectation of success in performing in situ testing, since it is well known in the art that no bus bars are needed to impose cathodic behavior to the substrate in electroless copper plating which would make it possible to test the substrate in situ.

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***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

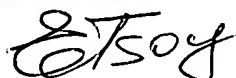
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy  
Primary Examiner  
Art Unit 1762

ELENA TSOY  
PRIMARY EXAMINER



March 12, 2007